REMARKS

The 27 August 2009 Final Office Action has been carefully studied and considered. In response, independent claim 115 is amended herein to recite that the claimed solar cell semiconductor device also includes an electrically conductive shunt extending from the lateral conduction layer to the substrate in contact with the sequence of layers of material disposed underneath the bypass diode in the second region. The shunt shorts the layers of material under the bypass diode in the second region. Independent claims 47, 112, 122 and 129 have also been amended. Independent claim 69 already contained similar language. None of the cited references, alone or in combination, teach or suggest a solar cell semiconductor device having the shorting feature recited in the pending independent claims.

Figure 8 of the Boutros reference (U.S. Patent No. 6,635,507) shows a bypass diode 810 disposed on several layers of semiconductor material which form two solar cells 804 and 806. A GaAs cap layer 812 is disposed on the cathode side (i.e. the uppermost n-type GaInP layer) of the bypass diode 810. A metal contact layer 816 extends from the GaAs cap layer 812 on the bypass diode 810 to the germanium substrate 802 below the diode. However, Figure 8 of Boutros also shows an isolation layer 814 that separates the metal contact layer 816 from the layers of semiconductor material disposed under the bypass diode 810. Separating the metal contact layer 818 from the layers of semiconductor material disposed under the bypass diode 810 ensures the bypass diode 810 can be connected to the solar cells 804, 806 in an anti-parallel configuration. See Figures 1B, 2B, 3B and 4B and col. 7, lines 47-65 of Boutros. If the semiconductor layers under the bypass diode 810 were in contact with the metal layer 816 and thus shorted as claimed, the bypass diode 810 would not be connected in an anti-parallel configuration with the solar cells 804, 806. Instead, the solar cells 804, 806 and the bypass diode 810 would each be shunted and thus removed from the circuit, rendering Boutros's device

inoperable for its intended purpose. Thus, none of the layers of semiconductor material under Boutros's bypass diode 810 are shorted by an electrically conductive shunt as claimed.

Turning to the Ho reference (WO 99/62125), Figure 14B of Ho shows a metallic C-clamp 1442 connecting a top metal contact area 1440 disposed on Ho's bypass diode 1410 to a metal layer 1430 disposed on a bottom surface of germanium substrate 1402. Neither the C-clamp 1442 nor the metal contact area 1440 disposed on the bypass diode 1410 are in contact with or short the layers of semiconductor material disposed under the bypass diode 1410 as claimed. If the C-clamp 1442 and/or metal contact area 1440 were in contact with and shorted the semiconductor layers under the bypass diode 1410 as argued on p. 6 of the Final Office Action, the tunnel diode and solar cell disposed under the bypass diode 1410 would each be shunted, rendering Ho's solar cell device 1400 inoperable for its intended purpose. Figure 14B of Ho clearly shows that none of the semiconductor layers between metal layers 1430 and 1440 are shorted. Instead, the C-clamp 1442 electrically connects an upper metal layer (1440) to a lower metal layer (1430), thus connecting the bypass diode 1410 in "an anti-parallel configuration with respect to the photovoltaic portions of the solar cell 1400." See p. 8, lines 16-23 of Ho. If any of the semiconductor layers under the bypass diode 1410 were shorted as suggested on p. 6 of the Final Office Action, the bypass diode 1410 would not be connected in an anti-parallel configuration with the underlying solar cell, rendering Ho's device inoperable for its intended purpose. Thus, none of the semiconductor material layers 1412-1426 under the bypass diode 1410 are shorted by metal layer 1436 and/or C-clamp 1442 as claimed.

In both Boutros and Ho, respective metal connectors 812 and 1436/1440 are provided for connecting the corresponding bypass diode 810, 1410 in an anti-parallel configuration with the respective solar cells. The metal connectors 812 and 1436/1440 disclosed in Boutros and Ho do not short layers of semiconductor material as claimed. For at least these reasons, all pending claims are patentable over the cited references.

In view of the above amendments and remarks, the Applicants submit the present application is in condition for allowance, and such action is respectfully requested.

Respectfully submitted,

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